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TO: City of Seattle
FROM: ECONorthwest
SUBJECT: BENEFIT ACCOUNTING SUMMARY

The South Lander Street Project is anticipated to have many tangible benefits that will improve community health and wellbeing. In this section, the expected future benefits to the grade separation are quantified by comparing a scenario with the operation of the South Lander Street Project to a scenario without the grade crossing. Anticipated benefits include improvements in congestion from lower expected average commute times, anticipated fuel savings, and improvements in air quality from reduced CO2, PM2.5, NOx and VOC. The transportation benefits are determined using data outputs from a dynamic assignment traffic model. Finally, the net present value of project benefits was determined by totaling the stream of annual benefits over the 75-year project design life using discount rates of 7% and 3%, respectively. Figure 1 summarizes the quantified benefits from the project.

Figure 1: Summary of Economic Benefits and Costs from South Lander Street Project- 2014 Dollars

Benefit	Discount Rate = 7.0%	Discount Rate = 3.0%
Time Savings	**$235,483,945**	**$690,891,214**
Heavy Truck	$100,112,492	$253,157,384
Medium Truck	$4,722,700	$22,206,324
Personal Vehicle	$130,648,753	$415,527,506
Fuel Savings	**$198,353**	**$195,585**
Gasoline	-$49,628	-$102,679
Diesel	$247,981	$298,264
Emissions Savings	**$192,496**	**$246,198**
CO_2	$53,561	$53,561
$PM_{2.5}$	$106,472	$150,731
NO_x	$31,635	$40,662
VOC	$828	$1,245
Total Benefits	**$235,874,794**	**$691,332,998**
Project Cost	**-$105,283,973**	**-$123,577,050**
Net Benefit	**$130,590,821**	**$567,755,948**

Overall, the South Lander Street Project is expected to eliminate delay and reduce emissions. With a discount rate of 7%, the total design benefits of the project are approximately $235 million, when using a discount rate of 3%, the project benefits exceed $690 million. The largest contributing factor to these benefits is due to improvements in commute time savings. With a discount rate of 7%, personal vehicles and heavy trucks receive the largest valued reductions in commute times, equivalent to approximately $130 million and $100 million, respectively. Travel time savings result from one of two potential sources. Existing travelers in the corridor benefit from shorter delays and faster travel with the South Lander Street Project compared to baseline travel conditions. In addition, after the grade crossing is constructed, some

travelers may choose to reroute their journey within the study area to take advantage of the more reliable trip times that result in reduced congestion elsewhere in the transportation network. Reduced air pollution also contributes a relatively small, but non-negligible share of overall project benefits. The total value of air pollution reduction has a present value of $192,000 using a discount rate of 7% or $246,000 with a discount rate of 3%. The total benefits to reduced fuel consumption are equivalent to approximately $198,000 with a discount rate of 7%. However, reductions in diesel consumption are somewhat offset by increases in consumption of gasoline.

There are several other expected benefits to the South Lander Street Project that, although difficult to empirically quantify, are important to acknowledge. Firstly, separating automobile traffic and rail traffic at a busy transportation corridor is likely to cause significant improvements in future safety conditions. For instance, during the period 2011 to 2015, there were a total of 85 vehicle collisions, seven bicycle and six pedestrian collisions that occurred in the S Lander St rail corridor. Based upon an analysis of the conditions that led to these collisions, approximately 32 (35%) of these collisions could have been avoided through the institution of the South Lander Street Project. Accounting for the combined cost of property damage, injury and the potential for fatality, the National Highway Transit Safety Administration (NHTSA) estimates that the average cost of a vehicle collision is approximately $22,000 in 2013 dollars.[1] So, even small reductions in the collision rate could have large economic impacts when considered over the full project design life.

Although not quantified in the above analysis, the South Lander Street Project is also likely to significantly improve the operating condition for bicycle and pedestrian travelers in this area. The final project design will include a mixed-use facility for people walking and biking on the north side of the crossing. Increased accessibility for these users has the potential to decrease commute times, increase safety and increase recreational enjoyment of people walking and biking in this area.

The South Lander Street Project also supports incident management goals for the City and the region. SODO is located on soils subject to liquefaction during seismic events, and the S Lander St Grade Separation Project would create a resilient network connection to critical industrial, port and rail facilities. Similarly, the grade separation is a resiliency route for regular, oversized and heavy-haul freight traffic under less extreme incident conditions typical of a mature urban environment.

[1]Blincoe, L., T. R. Miller, E. Zaloshnja, and B. A. Lawrence. 2014. The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (No. DOT HS 812 013).